

**REPORT ON THE CONSERVATION STATUS OF
LESQUERELLA PAYSONII IN IDAHO**

by

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Taxon Name: *Lesquerella paysonii* Rollins

Common Name: Payson's bladderpod

Family: Brassicaceae

States Where Taxon Occurs: U.S.A.; Idaho, Wyoming, Montana

Current Federal Status: Species of Concern

Recommended Federal Status: None

Author of Report: Robert K. Moseley

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SUMMARY

Lesquerella paysonii (Payson's bladderpod) is largely endemic to the carbonate mountain ranges of west-central Wyoming and adjacent Idaho. Two disjunct populations are known from southwestern Montana. In Idaho, it occurs on the ridges and high peaks of the Snake River Range above the escarpment that parallels the Snake River. These populations are contiguous with its known distribution in Wyoming and extend about 12 miles northwest into Idaho from the border. One population is disjunct from its main range in Idaho, occurring 19 miles to the southwest on Caribou Mountain. In 1996, Payson's bladderpod plants appeared vigorous and the populations appeared to contain a variety of age classes, indicating a healthy population. Some populations are very small, while others cover large areas and contain many thousands of individuals. There is little evidence of threats to viability. One population has persisted for 60 years since its discovery. All known populations in Idaho occur at least partially on public land managed by the U.S. Forest Service.

Our populations are more or less continuous with its Wyoming distribution, where 33 occurrences are known. Most are large, at high elevations with few threats, and some are in designated Wilderness and proposed Research Natural Areas. A status survey was completed for Wyoming in 1996, and we both agree that Payson's bladderpod should not be considered a Species of Concern by the U.S. Fish and Wildlife Service in Wyoming or Idaho. We also recommend that it be dropped from the Forest Service Sensitive Species list for the Intermountain Region (Bridger-Teton, Caribou, and Targhee national forests). The Idaho CDC and Wyoming Natural Heritage Program will continue to track its occurrences and the global rank will remain a G3, due to its limited geographic range. Detailed discussions on the taxonomy, distribution, abundance, habitat requirements, conservation status, and recommendations to federal and state agencies are included in this report.

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I. Species Information.

1. Classification and nomenclature.

A. Species.

1. Scientific name.

a. Binomial: *Lesquerella paysonii* Rollins

b. Full bibliographic citation: Rollins, R. 1950. Studies on some North American Cruciferae. Contributions to the Gray Herbarium 171:42-53.

c. Type specimen: USA, Wyoming, Lincoln County, mountains near Cottonwood Lake, east of Smoot, *Payson & Armstrong 3816* (GH, COLO, MO).

2. Pertinent synonym(s): None.

3. Common name(s): Payson's bladderpod

4. Taxon codes: PDBRA1N190 (Natural Heritage and Conservation Data Center Network and The Nature Conservancy).

5. Size of genus: About 95 species, generally in North America, with 12 or so species in South America (Rollins 1993).

B. Family classification.

1. Family name: Brassicaceae

2. Pertinent family synonyms: Cruciferae

3. Common name(s) for family: Mustard Family

C. Major plant group: Dicotyledonea

D. History of knowledge of taxon in Idaho: *Lesquerella paysonii* was first collected in Idaho by Payson from the summit of Caribou Mountain sometime during the 1920's or 1930's. No other populations were known from Idaho until 1991, when Ron Hartman collected it in two areas of the Snake River Range. Stuart Markow, as part of his master's thesis (Markow 1992; 1994; Markow and Fertig 1993), and Markow and Rose Lehman, as part of survey work for the Targhee National Forest, added to our knowledge of its distribution in the Snake River Range between 1991 and 1995. I surveyed the Caribou Range and Snake River Range in 1996.

E. Comments on current alternative taxonomic treatment(s): None.

2. Present legal or other formal status.

A. International: None.

B. National.

1. Present designation or proposed legal protection or regulation: *Lesquerella paysonii* is currently recognized as a Species of Concern by the Snake River Basin Field Office of the U.S. Fish and Wildlife Service. Species of Concern are those where available information supports tracking the status and threats to species because of one or more of the following factors:

- A. Negative population trends have been documented.
- B. Habitat is declining or threats to the habitat are known.
- C. Subpopulations or closely related taxa have been documented to be declining.
- D. Habitats for life phases outside of Idaho (*i.e.*, migratory habitat) are known to be threatened.
- E. Competition or genetic implications from introduction/stocking of exotic species.
- F. Identified as a species of concern by agencies or professional societies.
- G. In combination with any of the other criteria, information is needed on status or threats to the species.

2. Other current formal status recommendation: The Natural Heritage and Conservation Data Center network and The Nature Conservancy rank *Lesquerella paysonii* G3, a rank that indicates that the taxon is globally rare and uncommon (Conservation Data Center 1994).

The U.S. Forest Service maintains *Lesquerella paysonii* as a sensitive species for the Intermountain Region's Bridger-Teton, Caribou, and Targhee national forests.

3. Review of past status: Shultz and Shultz (1978) were the first to recommend that *Lesquerella paysonii* be made a federal candidate, due to its limited range. Later, McKibben (1979) proposed not to recommend the species as a federal candidate.

Lesquerella paysonii was treated as a category 2 candidate (U.S. Fish and Wildlife Service 1993). Later, it was removed from candidate status by the U.S. Fish and Wildlife Service.

C. State.

1. Idaho.

a. Present designation or proposed legal protection or regulation: None.

b. Other current formal status recommendation: Prior to my 1996 survey, the Conservation Data Center state rank (S) was S1 (Conservation Data Center 1994). I recommend that the state rank be changed in a later section of this report.

The Idaho Native Plant Society includes *Lesquerella paysonii* on its list of globally rare species in Idaho (Idaho Native Plant Society 1996).

c. Review of past status: Holte (1981) recommended that it be added to the State Watch List in Idaho.

3. Description.

A. General nontechnical description: *Lesquerella paysonii* is a low-growing perennial, with a basal rosette of leaves emanating from a slender taproot. Basal leaves are spatulate, with an elliptic blade that narrows to a long petiole. The basal rosette of leaves can be up to 6 inches in diameter. Several inflorescences of up to a dozen flowers each emanate from the basal rosette and are up to 4 times as long as the leaves. The small flowers have yellow petals, eventually forming small ellipsoid fruits. The fruits are obcompressed, which means that the planar surface of the fruits is perpendicular to the partition that separates the two valves. The entire plant has a silvery-gray color due the near complete covering of branched hairs.

B. Technical Description: Plants short-lived perennials, densely pubescent; trichomes sessile or on a short stalk, roughly granular, the rays numerous but distinct at their bases, forked and often bifurcate; stems 0.3-1.5 dm long, decumbent, slender and unbranched, arising laterally from the simple caudex; basal leaves 1-4 (6) cm long, 4-10 (15) mm wide, the blades broadly triangular to rhombic or elliptic, often sinuate or shallowly lobed, narrowing gradually or abruptly to the slender petiole, this sometimes lobed and the leaf pinnatifid; cauline leaves 0.5-1.5 cm long, 2-6 mm wide, elliptic and narrowing to a short petiole; inflorescences compact, the buds ellipsoid; sepals 5-7.5 mm long, oblong to elliptic, boat-shaped, the lateral ones markedly saccate; petals yellow, 8-10 mm long, 1.5-2.5 mm wide, narrowly spatulate; filaments slender, not dilated, paired stamens 5.5-7 mm long, single stamens 4-6 mm long; glandular tissue roughly pentagonal around the single stamens and subtending the paired, but absent between these; infructescences elongated or dense, often secund; pedicels 4-10 mm long, more or less sigmoid; silques 5-9 mm long, substipitate, elliptic and strongly obcompressed but not keeled, the valves pubescent on the exterior and usually glabrous on the interior; septum entire and smooth, the funicles attached about 1/3 their lengths; styles 2-4 mm long, sometimes pubescent at the base, stigmas slightly expanded; ovules 5-8 per locule; seeds about 2 mm long, suborbicular to oblong and only slightly flattened, reddish-brown, neither margined nor winged; cotyledons exactly or obliquely accumbent, as long as or slightly shorter than the radicle (Rollins and Shaw 1973).

C. Local field characters: *Lesquerella paysonii* is a low-growing, silvery-gray plant, often similar in color to its rocky, carbonate substrate. Superficially, it appears similar to many other species of *Lesquerella* and to a related mustard genus, *Physaria*. I saw no other *Lesquerella* within the range and habitat of *L. paysonii* in Idaho. The obcompressed fruits that lack a keel on the margin are distinctive and distinguish it from all other species in our area. The lack of keels on the fruit is important, because a closely related species, *L. carinata*, appears similar to *L. paysonii* in all respects except it has keeled (carinate) margins on the obcompressed fruit. In Idaho, the ranges of *L. paysonii* and *L. carinata* are not known to overlap. *Lesquerella carinata* is known from farther north, in east-central Idaho, and not known from within the range of *L. paysonii* in the Snake River and Caribou ranges (Markow 1994). *Lesquerella paysonii* from the summit of Caribou Mountain (occurrence 001) was misidentified as *L. occidentalis* by Dieffenbach (1977).

Lesquerella paysonii has a habit that is similar to *Physaria integrifolia*, which occurs throughout the range of *L. paysonii* in Idaho. The two are sympatric on Baldy Mountain (*L. paysonii* occurrence 008). Both species are generally silvery-gray, rosetted plants that are prostrate on gravelly soil. Among other differences, however, the *Physaria* is more robust with greater dimensions in all aspects.

D. Identifying characteristics of material which is in interstate or international commerce or trade: No interstate or international trade is known. See above section for differences with a related species.

E. Photographs and/or line drawings: Line drawings appear in Rollins and Shaw (1973) and Fertig (1994), the latter being reproduced in Appendix 1. Photographs of the habit and habitat in Wyoming also are published in Fertig (1994). Photographic slides of the habit and habitat of *Lesquerella paysonii* in Idaho occur in the slide collection of the Conservation Data Center, several of which are reproduced in Appendix 4.

4. Significance.

A. Natural: None known.

B. Human: None known.

5. Geographical distribution.

A. Geographical range: *Lesquerella paysonii* is largely endemic to the carbonate mountain ranges of west-central Wyoming, in Teton, Sublette, and Lincoln counties (Scott 1966; Dorn 1988; Fertig 1992; 1994), and adjacent Bonneville County, Idaho. Two disjunct populations are known from Beaverhead and Granite counties, Montana (Heidel 1996; Figure 1).

In Idaho, it occurs on the ridges and high peaks of the Snake River Range above the escarpment that parallels the the Snake River. These populations are contiguous with its known distribution in Wyoming and extend ca. 12 miles northwest into Idaho from the border. One population is disjunct from its main range in Idaho, occurring ca. 19 miles to the southwest on Caribou Mountain. Apparently suitable habitat exists in the intervening portion of the Caribou Range, but no populations were found in 1996.

Lesquerella paysonii has also been reported from Davis County, Utah, by Shultz and Shultz (1978), but does not appear in a recent treatment of the Utah flora (Welsh *et al.* 1987). Shultz and Shultz (1978) state that the Utah specimen is of questionable identity due to its immature fruits, which are critical to the identification of *L. paysonii*.

B. Precise occurrences in Idaho.

1. Populations currently or recently known extant: *Lesquerella paysonii* is known from eight occurrences in Bonneville County, as listed below with their three-digit CDC code. All have been visited between 1991 and 1996. The occurrence records from the CDC data base appear in Appendix 2 and maps of the occurrences appear in Appendix 3.

**Figure 1. Distribution of *Lesquerella paysonii*;
Wyoming and Idaho - shaded; Montana - dots.**

Caribou Range:

001 - Caribou Mountain

Snake River Range:

002 - Spring Run Canyon - Elbow Canyon Divide

003 - Sheep Creek Peak/Sheep Peak

004 - Needle Peak SW

005 - Spaulding Basin NE

006 - Little Palisades Peak

007 - Mount Baird NE

008 - Baldy Mountain/Paradise Basin

2. Populations known or assumed extirpated: None.

3. Historically known populations where current status not known: None.

4. Locations not yet investigated believed likely to support additional natural populations:

See also Section III.17.C, Fieldwork, for details of *Lesquerella paysonii* inventories that have been conducted recently.

Snake River Range - The general distribution of *Lesquerella paysonii* in the Snake River Range is reasonably well documented. Certainly, additional populations or extensions of known populations may be found in the future within this range. The ridges and summits northwest of the Upper and Lower Palisades Lakes, especially Atkinson and Thompson peaks, are high priority prospects.

Caribou Range - I checked many ridges in the Caribou Range, south of the Snake River but only found it on Caribou Mountain. It is possible that other ridge systems may contain populations, especially in the western portion, such as Red Ridge.

Big Hole Mountains - There are no known populations of *L. paysonii* in the Big Hole Mountains, northwest of and more or less contiguous with the Snake River Range. This despite recent plant exploration activity (Markow 1994), although there has been no systematic inventory of potential habitat for the species. Nevertheless, there appears to be suitable habitat in the core of the range that should be surveyed before the area is totally written off as being outside the range of *L. paysonii* in Idaho.

5. Reports having ambiguous or incomplete locality information: None.

6. Locations known or suspected to be erroneous reports: None.

6. General environment and habitat description.

A. Concise statement of general environment: In Idaho, *Lesquerella paysonii* mostly occurs on ridgelines and less so on slopes in openings in sagebrush and forest stands. The substrate consists of

carbonate parent material with gravelly, skeletal soils. Plant communities are open, with low cover of forbs, grasses, and an occasional shrub. Most of the ground cover is exposed rock and soil. Elevations range from 6,000 ft to 9,950 ft, with most populations occurring above 8000 ft.

B. Physical characteristics.

1. Climate.

a. Koppen climate classification: Populations of *Lesquerella paysonii* occur in an area classified as Koppen's unit H: Undifferentiated Highlands (Trewartha and Horn 1980).

b. Regional macroclimate: Climate of eastern Idaho is influenced by moist air masses from the Pacific Ocean and Gulf of Mexico and dry, often cold continental air from Canada. During winter months, either cyclonic storms from the Aleutian Low or dry continental air from Canada dominate. Air masses from the Pacific moving through California, Nevada, and Utah, also bring moisture during winter and at other times of the year. In the summer, air masses from the Gulf of Mexico bring moisture. As a result, the weather of eastern Idaho is transitional between areas to the north and west that are affected primarily by moist Pacific air and to a lesser extent by continental air from Canada, and areas to the east and south that are influenced strongly by moist Gulf air. The resulting precipitation within the range of *Lesquerella paysonii* is relatively uniform throughout the year, with the foothills receiving as little as 10 inches of precipitation annually and the highest elevations exceeding 40 inches. Average annual temperatures in eastern Idaho range from 30°F to 40°F, but may approach 45°F in the lower valleys (USDA, Forest Service 1985).

No climatic data are available for the higher elevations of eastern Idaho within the range of *Lesquerella paysonii*, however, the record for Swan Valley, Idaho, along the western edge of its range and 2000 to 3000 feet lower than most populations gives an indication of climatic trends. Precipitation is greater and temperatures lower for *L. paysonii* populations.

Climatic Records for Swan Valley, Idaho
Elevation 5370 feet; 1936-1981
(NOAA records summarized by Johnson 1981)

Month	Mean Temperature (°F)	Mean Precipitation (Inches)
January	19.6	1.62
February	24.2	1.11
March	30.9	0.91
April	40.4	1.47
May	49.3	2.17
June	56.7	1.83
July	64.3	1.14
August	62.2	1.26
September	54.2	1.41
October	43.9	1.19

Climatic Records for Swan Valley, continued.

Month	Mean Temperature (°F)	Mean Precipitation (Inches)
November	32.1	1.45
December	22.5	1.34
Mean Annual	41.7	16.9
Mean April-September	54.5	9.28
Mean October-March	28.8	7.62
Maximum	99.0	22.7
date	July 27, 1975	1963
Minimum	-43.0	10.6
date	12-18-63	1964

c. Local microclimate: The local microclimate of *Lesquerella paysonii* is best characterized as dry and open. It occurs on gravelly, well-drained substrates that, in most cases, are exposed to prevailing winds throughout the year. Its habitat is in topography that indicates low snow deposition, that is, ridgelines and upper slopes usually on the windward side of ridges.

2. Air and water quality requirements: Unknown.

3. Physiographic provinces: The entire distribution of *Lesquerella paysonii* is encompassed by Bailey's Overthrust Mountain Section (M331D) of the Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest Province (McNab and Avers 1994).

Occurrences of *Lesquerella paysonii* in Idaho, fall within the Middle Rocky Mountain Geomorphic Province (Ross and Savage 1967; Wellner and Johnson 1974). Following the Idaho Floristic Regions of Ertter and Moseley (1992), Idaho populations occur in the Wasatch Unit of the Southeastern Mountains Division.

4. Physiographic and topographic characteristics: *Lesquerella paysonii* occurs on montane, subalpine, and alpine ridgelines and the upper portions of southerly slopes in highly dissected mountains. Elevations range from 6,000 ft to 9,950 ft, with most populations occurring above 8000 ft.

5. Edaphic factors: The bedrock parent material of all *Lesquerella paysonii* populations in Idaho is Paleozoic and Mesozoic carbonate sedimentary formations (Mitchell and Bennett 1979).

The Caribou Mountain population (occurrence 001) occurs on rocks mapped as the Mesozoic Gannet Group, a Cretaceous unit consisting of sandstone, fine-grained limestone, siltstone, shale, and conglomerate formations. It appeared that *L. paysonii* was restricted to the limestone, and did not occur on the other Cretaceous rock types or Tertiary igneous rocks on the same ridges. Abrupt contact between the formations was visible and it coincided with breaks in the distribution of *L. paysonii*.

Populations in the Snake River Range all occur on Paleozoic sediments of several ages, as follows:

- 002 - Cambrian Gros Ventre and Gallatin formations
- 003 - Devonian Darby Formation, Mississippian Lodgepole and Mission Canyon formations, and Pennsylvanian/Mississippian Amsden Formation
- 004 - Ordovician Darby Formation
- 005 - Mississippian Mission Canyon Formation
- 006 - Permian/Pennsylvanian Wells Formation
- 007 - Pennsylvanian/Mississippian Amsden Formation, Permian/Pennsylvanian Wells Formation
- 008 - Pennsylvanian/Mississippian Amsden Formation, Mississippian Mission Canyon Formation, Mississippian Lodgepole Formation

All of these formations are primarily comprised of carbonate sedimentary units, with either limestone and/or dolomite. The northeastern edge of the distribution of *L. paysonii* parallels a major thrust fault zone that bisects the center of the Snake River Range (Mitchell and Bennett 1979). Northeast of the fault zone lie Mesozoic, primarily Cretaceous sediments, while on the southwest side of the faults lie Paleozoic sediments. I conducted extensive searches on both sides of the fault zone and found no populations on the Cretaceous sediments, which are primarily shale, sandstone, and siltstone rocks of the Bear River and Frontier formations.

6. Dependence of this taxon on natural disturbance: *Lesquerella paysonii* is restricted to open communities with a high cover of bare soil and sparse vegetative cover. This may indicate that it lacks the competitive ability to survive in closed communities and requires natural surface disturbance to reduce competition and maintain open soil. The disturbance comes from a combination of wind and water erosion, frost heaving, and pocket gopher digging.

7. Other unusual physical features: None

C. Biological characteristics.

1. Vegetation physiognomy and community structure: Habitats containing *Lesquerella paysonii* are dominated by low forbs, with plants rarely averaging greater than 12 inches tall. Grasses, such as *Leucopoa kingii*, *Poa epilis*, and *Poa secunda*, are widely scattered and do not amount to much cover. Shrubs are virtually absent from these communities, with only widely scattered plants of *Symphoricarpos oreophilus*, *Artemisia tridentata* ssp. *vaseyana*, *Haplopappus suffruticosus*, and others. Total plant cover is low and exposed soil and surface rock is high.

2. Regional vegetation type: Plant associations containing *Lesquerella paysonii* are unclassified. Surrounding vegetation is comprised of *Abies lasiocarpa* forest habitat types (Steele *et al.* 1983) and the *Artemisia tridentata* ssp. *vaseyana*/*Leucopoa kingii* association (Rust 1996). Populations occur in the montane, subalpine and alpine zones, the latter zone is restricted to the summits of the highest peaks, such as Caribou Mountain and Sheep Creek Peak.

3. Frequently associated species:

Native Species: *Arenaria congesta*, *Cymopterus hendersonii*, *C. glaucus*, *Haplopappus suffruticosus*, *Arabis lemmonii*, *Artemisia ludoviciana*, *Lupinus argenteus*, *Pachistima myrsinites*, *Leucopoa kingii*, *Poa secunda*, *Poa epilis*, *Erigeron speciosus*, *E. compositus*, *Senecio crassa*, *S. streptanthifolius*, *Helianthella uniflora*, *Stipa occidentalis*, *Sedum lanceolatum*, *S. debile*, *Hedysarum boreale*, *Eriogonum heracleoides*, *E. umbellatum*, *Symphoricarpos oreophilus*, *Antennaria microphylla*, *Ivesia gordonii*, *Achillea millefolium*, *Solidago multiradiata*, *Androsace septentrionalis*, *Pedicularis contorta*, *Thlaspi montanum*, *Synthyris pinnatifida*, *Artemisia tridentata* ssp. *vaseyana*.

Alien Species: None observed.

4. Dominance and frequency: All plant species in its habitat are widely scattered, although *Lesquerella paysonii* can be relatively common in some areas.

5. Successional phenomena: The communities containing *Lesquerella paysonii* are probably successional stable over the long-term.

6. Dependence on dynamic biotic features: None known.

7. Other endangered species: *Salix glauca*, a state rare species (Idaho Native Plant Society 1996) on the edge of its range in eastern Idaho, occurs in adjacent, north-facing habitat at the Sheep Creek Peak/Sheep Peak occurrence (003).

7. Population biology.

A. General summary: The size of Idaho's *Lesquerella paysonii* populations varies widely, ranging from 10 individuals on a few square feet to many thousands of plants over several miles of ridgeline. Plants probably flower in early July because they are all in fruit by late July. Pollination, reproductive, seed, and seedling biology are largely unknown. The age (inferred from size) class structure of the populations appeared well distributed indicating that it is reproducing successfully.

B. Demography.

1. Known populations: Population estimates were made for six of the eight occurrences and they range widely in terms of population size and area occupied, as follows:

001 - I estimated many thousands of individuals occurring over about 2 linear miles of ridgeline in 1996.

002 - No estimates were made by Ron Hartman.

003 - I estimated many thousands of individuals occurring over about 4 linear miles of ridgeline in 1996.

004 - Stuart Markow estimated 100-200 individuals in 1995. No area was estimated.

005 - Rose Lehman noted that an unknown number of individuals occurred along about 0.5 mile of ridgeline in 1995.

006 - Markow estimated that 100-200 individuals occur along 0.4 mile ridgeline in 1995.

007 - Markow found 10-20 plants in 10 square feet in 1995.

008 - I discovered many thousands of plants along about 2 miles of ridgeline in 1996.

2. Demographic details: Demographic details for each occurrence in Idaho, if known, appear in Appendix 2.

C. Phenology.

1. Patterns: Pattern is largely unknown, but *Lesquerella paysonii* probably flowers in early to mid-July, because plants at all occurrences were in fruit when surveyed in late July, August and September, 1991-1996.

2. Relation to climate and microclimate: As with most species growing in non-forest habitats in Idaho, phenology varies widely from year to year depending on climatic patterns. The phenology of *Lesquerella paysonii* probably varies from year to year depending on the snowpack depth and spring melting patterns.

D. Reproductive ecology.

1. Type of reproduction: *Lesquerella paysonii* reproduces only by seed.

2. Pollination.

a. Mechanisms: Cross-pollination is the norm in *Lesquerella*, with bees and flies the most commonly observed pollinators (Rollins and Shaw 1973). Specific pollination mechanisms are unknown in *L. paysonii*.

b. Specific known pollinators: Unknown.

c. Other suspected pollinators: Unknown.

d. Vulnerability of pollinators: Unknown, but insect populations are vulnerable to insecticides and sheep grazing (Sugden 1985), the latter being common in the range of *Lesquerella paysonii* in Idaho.

3. Seed dispersal.

a. General mechanisms: The plants are prostrate and the fruits lie close to the ground. There are no apparent long-distance dispersal vectors, although animal transport is possible.

b. Specific agents: Gravity and water(?).

c. Vulnerability of dispersal agents and mechanisms: Unknown.

d. Dispersal patterns: Specific details unknown.

4. Seed biology.

a. Amount and variation of seed production: Largely unknown, although seed set appeared to be vigorous in 1996.

b. Seed viability and longevity: Unknown.

c. Dormancy requirements: Unknown.

d. Germination requirements: Unknown.

e. Percent germination: Unknown.

5. Seedling ecology: Unknown.

6. Survival and nature of mortality of plants: Unknown.

7. Overall assessment of reproductive success: Fruit and seed production appeared to be good in 1996. The age class structure (as inferred from plant size) of the populations appeared well distributed, indicating that it is reproducing successfully.

8. Population ecology.

A. General summary: Little is known about the population ecology of *Lesquerella paysonii* in Idaho.

B. Positive and neutral interactions: None known.

C. Negative interactions.

1. Herbivores, parasites and diseases: Unknown in Idaho. Domestic sheep graze throughout the range of *Lesquerella paysonii* in Idaho. A large population of introduced mountain goats occurs in the Snake River Range and bed in and trail through its habitat, sometimes with locally heavy impacts. I observed no direct negative interactions during 1996, but one brief visit to the populations is not long enough to determine impacts to population viability. Sheep grazing has been shown to affect insect populations that pollinate rare plant species (Sugden 1985).

2. Evidence of competition.

a. Intraspecific: Unknown.

b. Interspecific: As mentioned earlier, *Lesquerella paysonii* occurs in very open communities and appears to be a poor competitor.

3. Toxic and allelopathic interactions with other organisms: Unknown.

D. Hybridization.

1. **Naturally occurring:** None known.
2. **Artificially induced:** None known.
3. **Potential in cultivation:** Unknown.

E. Other factors of population ecology: None.

9. Current land ownership and management responsibility.

A. General nature of ownership: All populations in the Snake River Range (occurrences 002-008) occur on public land managed by the Palisades Ranger District of the U.S. Forest Service. The Caribou Mountain occurrence (001) occurs mostly on public land administered by the Soda Springs Ranger District of the Caribou National Forest, however, the northern end of the population is on private mining patents. Both Montana populations are also on land managed by the Forest Service, as are most in Wyoming.

B. Specific landowners: See above. Owners of the private land at Caribou Mountain are unknown.

C. Management responsibility: Mostly the U.S. Forest Service.

D. Easements, conservation restrictions, special designations, etc.: None.

10. Management practices and experience.

A. Habitat management.

1. Review of past management and land-use experiences.

a. This taxon: The Caribou Mountain population was first discovered in the 1920's or 1930's. Although the population level then is unknown, the plant persisted as an apparently vigorous population here for the last 60 years. Mining has taken place in the vicinity, and some of the population is on private mining patents, but it appeared to me that no habitat has been destroyed on the mountain. Sheep have probably grazed here for many years. All other populations in Idaho were discovered during the 1990's.

b. Related taxa: None known.

c. Other ecologically similar taxa: Not known.

2. Performance under changed conditions: Unknown in Idaho.

3. Current management policies and actions: None known.

4. Future land use(s): Livestock grazing will probably continue throughout the range of *Lesquerella paysonii* in Idaho. The potential for mining activity to increase on Caribou Mountain is unknown. Currently, it appears dormant.

B. Cultivation.

1. Controlled propagation techniques: None known.

2. Ease of transplanting: Unknown.

3. Pertinent horticultural knowledge: None known.

4. Status and location of presently cultivated material.

a. Specimen plants: None known from Idaho.

b. Stored seed/propagule banks: None known from Idaho.

11. Evidence of threats to survival.

A. Present or threatened destruction, modification, or curtailment of habitat or range.

1. Past threats: None known.

2. Existing threats: Grazing will probably continue throughout the range of *Lesquerella paysonii* in Idaho. The long-term effect of this activity on population viability is unknown. The potential for mining activity to increase on Caribou Mountain is unknown. Currently, it appears dormant, but would represent a real and direct threat to the population from lost habitat if it became active. Impacts from recreationists and the introduced mountain goats appear to be minor.

3. Potential threats: See above.

B. Overutilization for commercial, sporting, scientific, or educational use.

1. Past threats: None known.

2. Existing threats: Minimal to no existing threats.

3. Potential threats: Minimal to no potential threats.

C. Disease, predation, or grazing.

1. Past threats: None known.

2. Existing threats: See Past and Existing Threats.

3. Potential threats: See Past and Existing Threats.

D. Inadequacy of existing regulatory mechanisms.

1. Past threats: N/A.

2. Existing threats: N/A, because no direct threats are known.

3. Potential threats: N/A.

E. Other natural or manmade factors.

1. Past threats: None.

2. Existing threats: None.

3. Potential threats: None.

II. Assessment and Recommendations.

12. General assessment of vigor, trends, and status in Idaho: In 1996, *Lesquerella paysonii* plants appeared vigorous and the populations appeared to contain a wide variety of age classes, indicating a healthy population. Because seven of the eight populations were discovered during the 1990's, and no monitoring program has been established, there is no evidence of expansion or contraction of any of the populations. Some populations are very small, while others cover large areas and contain many thousands of individuals. One population has persisted for 60 years since its discovery. Nearly all known populations are on public land managed by the U.S. Forest Service.

13. Recommendations for listing, status change, and/or conservation actions.

A. Recommendations to the U.S. Fish and Wildlife Service: Although *Lesquerella paysonii* has a restricted range in Idaho, some of the populations are large and appear to be vigorous and stable. Also, there is little evidence of threats to viability. Our populations are more or less continuous with its Wyoming distribution, where 33 occurrences are known. Most are large, at high elevations with few threats, and some are in designated Wilderness and proposed Research Natural Areas.

Walt Fertig, Wyoming Natural Heritage Program, and I agree that *L. paysonii* should not be considered a Species of Concern by the Fish and Wildlife Service in Wyoming or Idaho (a status report for *L. paysonii* in Wyoming is forthcoming from Walt sometime in late 1996 or early 1997). We also recommend that it be dropped from the Forest Service Sensitive Species list for the Intermountain Region (Bridger-Teton, Caribou, and Targhee national forests). The Idaho CDC and Wyoming Natural Heritage Program will continue to track its occurrences and the global rank will remain a G3, due to its small geographic range. It's distribution and abundance in Montana is not well understood and its conservation status may change as more knowledge is gained there.

B. Recommendations to other U.S. Federal Agencies.

1. U.S. Forest Service: See discussion above. I recommend removing it from the Sensitive Species list for the Targhee and Caribou national forests. However, because it has a restricted distribution in Idaho and the Forest Service manages nearly the entire global distribution for the species, I recommend that *Lesquerella paysonii* be added to the Forest watch lists.

C. Other status recommendations.

1. Municipalities): No recommendations.

2. Counties: No recommendations.

3. State(s) (Idaho):

a. Idaho Conservation Data Center: Although there are only eight populations in Idaho, I plan on changing the state rank from S1 to S2, due the large population size and apparent lack of threats.

b. Idaho Native Plant Society: The Idaho Native Plant Society should maintain *Lesquerella paysonii* on its list of globally rare species in Idaho.

4. Other Nations: No recommendations.

5. International Trade, etc.: No recommendations.

14. Recommended critical habitat: No critical habitat is recommended.

15. Conservation/recovery recommendations.

A. General conservation recommendations.

1. Recommendations regarding present or anticipated activities: None.

2. Areas recommended for protection: None.

3. Habitat management recommendations: None.

4. Publicity sensitivity: None.

5. Other recommendations: None.

B. Monitoring activities and further research recommendations: Forest Service personnel should be made aware of the existence of *Lesquerella paysonii* on the Caribou and Targhee national forests and should continue to submit updated information on existing populations and the location and status of new populations to the Idaho CDC or Wyoming Natural Heritage Program.

16. Interested parties:

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Targhee National Forest
P.O. Box 208
St. Anthony, ID 83445

Forest Supervisor
Caribou National Forest
Federal Building, Suite 294
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Program Director
Conservation Data Center
Idaho Department of Fish and Game
P.O. Box 25
Boise, ID 83707

Program Director
Wyoming Natural Heritage Program
1604 Grand Avenue, Suite 2
Laramie, WY 82070

Program Director
Montana Natural Heritage Program
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Helena, MT 59620

Idaho Native Plant Society
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Chief Botanist
The Nature Conservancy
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III. Information Sources.

17. Sources of information.

A. Publications.

1. References cited in report:

Conservation Data Center. 1994. Rare, threatened and endangered plants and animals of Idaho. Idaho Department of Fish and Game, Boise, ID. 39 p.

- Dieffenbach, T. 1977. Plant survey of the Caribou Mountain area. Unpublished report on file at the Department of Biology, Idaho State University, Pocatello, ID. 60 p.
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- Heidel, B.L. 1996. Montana plant species of special concern. Unpublished list on file at the Montana Natural Heritage Program, Helena, MT. 31 p.
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- McKibben, J. 1979. A program for threatened, endangered, and sensitive species on the Caribou National Forest and Curlew National Grasslands. Unpublished report on file at the Caribou National Forest, Pocatello, ID.
- McNab, W.H., and P.E. Avers, compilers. 1994. Ecological subregions of the United States: Section descriptions. WO-WSA-5. USDA Forest Service, Washington, D.C.
- Mitchell, V.E., and E.H. Bennett. 1979. Geologic map of the Driggs Quadrangle, Idaho. Geologic Map Series (2° Quadrangle). Idaho Bureau of Mines and Geology, University of Idaho, Moscow, ID.
- Moseley, R.K. 1990. Results of the 1989 search of regional herbaria for location information pertaining to Idaho's rare flora: The fourth generation search. Unpublished report on file at the Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 35 p., plus appendices.
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- Rollins, R.C., and E.A. Shaw. 1973. The genus *Lesquerella* (Cruciferae) in North America. Harvard University Press, Cambridge, MA. 288 p.
- Ross, S.H., and C.N. Savage. 1967. Idaho earth science: geology, fossils, climate, water, and soils. Idaho Department of Lands, Bureau of Mines and Geology, Earth Science Series 1. 271 p.
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Wellner, C.A., and F.D. Johnson, compilers. 1974. Research natural area needs in Idaho. A first estimate. University of Idaho, College of Forestry, Wildlife and Range Sciences, Moscow, ID. 179 p.

Welsh, S.L., N.D. Atwood, L.C. Higgins, and S. Goodrich. 1987. A Utah flora. Great Basin Naturalist Memoir No. 9. 894 p.

2. Other pertinent publications.

a. Technical:

Heidel, B.L. 1993. Status review of *Lesquerella* sp. novum, Butte District, Bureau of Land Management, Montana. Montana Natural Heritage Program, Helena, MT. 40 p.

Schassberger, L.A. 1991. Status review of *Lesquerella carinata* and *Lesquerella paysonii*, Deerlodge National Forest. Montana Natural Heritage Program, Helena, MT. 40 p.

Vanderhorst, J. 1995. Report on the conservation status of *Lesquerella carinata* var. *languida*, a candidate threatened species. Montana Natural Heritage Program, Helena, MT.

b. Popular: None.

B. Herbaria consulted: All regional and many national herbaria have been consulted several times over the years regarding specimens of Idaho's rare flora (see Moseley 1990). Herbarium specimens of *Lesquerella paysonii* from Idaho are listed in the appropriate field on the occurrence records in Appendix 2, where herbarium acronyms follow Holmgren *et al.* (1990).

C. Fieldwork: Below is a summary of the fieldwork I conducted during August and September 1996 for *Lesquerella paysonii* in Idaho. Other general floristic and rare plant surveys have been conducted in recent years by Ron Hartman, Rocky Mountain Herbarium, and Stuart Markow, Rose Lehman, and Bob Specht, Targhee National Forest.

Caribou Range:

- o Caribou Mountain (001)- main and spur ridges around the summit.
- o Bald Mountain - full length of summit ridge.
- o Black Mountain - full length of summit ridge.
- o Big Elk Mountain - high ridges to south, north and west of summit.

Snake River Range:

- o crest of range from Pole Canyon to WY border, including Oliver Peak.
- o Pole Canyon to Fogg Hill.
- o Baldy Mountain (008) - main crest from Little Baldy Mtn to Paradise Basin.
- o Sheep Creek Peak along divide to Sheep Peak (003) - and spur ridges.
- o Mt. Baird - too much snow; likely habitat.

D. Knowledgeable individuals:

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Bob Specht
Targhee National Forest
Teton Basin Ranger District
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Rose Lehman
Island Park Ranger District
P.O. Box 20
Island Park, ID 83429

Stuart Markow
Formerly of the Targhee National Forest

Ron Hartman
Rocky Mountain Herbarium
University of Wyoming
3165 University Station
Laramie, WY 82071

E. Other information sources: None known.

18. Summary of material on file: Color slides, field forms, maps, and most published and unpublished references pertaining to *Lesquerella paysonii* in Idaho are on file at the Idaho Conservation Data Center office.

IV. Authorship.

19. Initial authorship:

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20. Maintenance of status report: The Idaho Conservation Data Center will maintain current information for Idaho and update the status report as needed.

V. New information.

21. Record of revisions: N/A.

Appendix 1

Line drawing of *Lesquerella paysonii* from Fertig (1994)

Appendix 2

Idaho Conservation Data Center records for *Lesquerella paysonii* in Idaho

Appendix 3

Maps of *Lesquerella paysonii* distribution in Idaho

Map 1. Overview of distribution in Idaho (copied from 1:250,000 DeLorme Idaho Atlas and Gazetteer).

Map 2. Caribou Mountain occurrence 001 (from 1966 Caribou Mtn 7.5' quadrangle).

Map 3. Spring Run Canyon-Elbow Canyon Divide 002 and Sheep Creek Peak/Sheep Peak 003 (from 1966 Thompson Peak and Palisades Dam 7.5' quadrangles).

Map 4. Needle Peak SW 004 and Spaulding Basin NE 005 (from 1966 Mount Baird 7.5' quadrangle).

Map 5. Little Palisades Peak 006 and Mount Baird NE 007 (from 1966 Palisades Peak 7.5' quadrangle).

Map 6. Baldy Mountain/Paradise Basin 008 (from 1966 Thompson Peak 7.5' quadrangle).

Appendix 4

Slides of the habit and habitat of *Lesquerella paysonii* in Idaho

- Slide 1. Close-up of *Lesquerella paysonii* fruits; note obcompressed fruits with rounded (non-keeled) margins.
- Slide 2. Close-up of whole plant in fruit.
- Slide 3. Typical habitat for *L. paysonii*, here along the ridgecrest on Caribou Mountain.